

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

INFLUENCE OF WINTER RATIONS ON THE GROWTH OF STEERS ON PASTURE

By E. W. SHEETS
Animal Husbandry Division



UNITED STATES DEPARTMENT OF AGRICULTURE
DEPARTMENT CIRCULAR 166

Contribution from the Bureau of Animal Industry
JOHN R. MOHLER, Chief

Washington, D. C.

March, 1921

CONTENTS.

<p>Objects of the work-----</p> <p>Kinds of steers used-----</p> <p>Method of feeding and handling-----</p> <p style="padding-left: 20px;">Feeds used-----</p> <p style="padding-left: 20px;">Rations fed-----</p> <p style="padding-left: 20px;">Pasture-----</p>	<p>Page.</p> <p>3</p> <p>5</p> <p>5</p> <p>5</p> <p>5</p> <p>5</p>	<p>Graphic representations of the losses and gains-----</p> <p>Summary-----</p>	<p>Page.</p> <p></p> <p>5</p> <p>10</p>
--	--	---	---

INFLUENCE OF WINTER RATIONS ON THE GROWTH OF STEERS ON PASTURE.

On December 22, 1914, the Animal Husbandry Division, of the Bureau of Animal Industry, United States Department of Agriculture, in cooperation with the West Virginia Agricultural Experiment Station, began a series of beef-cattle experiments on the farm of David Tuckwiller, in Greenbrier County, W. Va., to study beef-production problems in the Appalachian Mountain region. This farm is situated in the southeastern part of the State, in the blue-grass area. The results of this experiment apply not only to West Virginia, but, as a whole or in part, to the adjacent States in the Appalachian Mountain region, from Alabama on the south to New York on the north, that have similar conditions. Results of the first four years of the work are here briefly summarized, with the addition of several graphic figures.

OBJECTS OF THE WORK.

It has been a common practice in the area mentioned to winter steers on dry feed, such as hay, corn stover, and wheat straw, and on corn silage to a lesser extent, in a way that causes them to lose materially in weight. They are then pastured the following summer and sold from grass either as stockers or feeders or as finished steers for the market. There are some who hold to the idea that it is profitable to permit this loss of weight, which with older steers oftentimes amounts to from 25 to 100 pounds. There are others also who believe that cattle wintered on silage, or on a ration of which silage is a part, do not do well on grass the following summer.

This experiment as outlined had these general problems in view:

First, the effect of different wintering rations upon subsequent pasture gains.

Second, the most satisfactory and economical method of wintering.

Third, the best method and the cost of raising beef cattle in the Appalachian Mountain region.

NOTE.—Those interested in the details of this experiment should obtain Department Bulletin 870, from the Superintendent of Documents, Government Printing Office, Washington, D. C. Price, 5 cents.

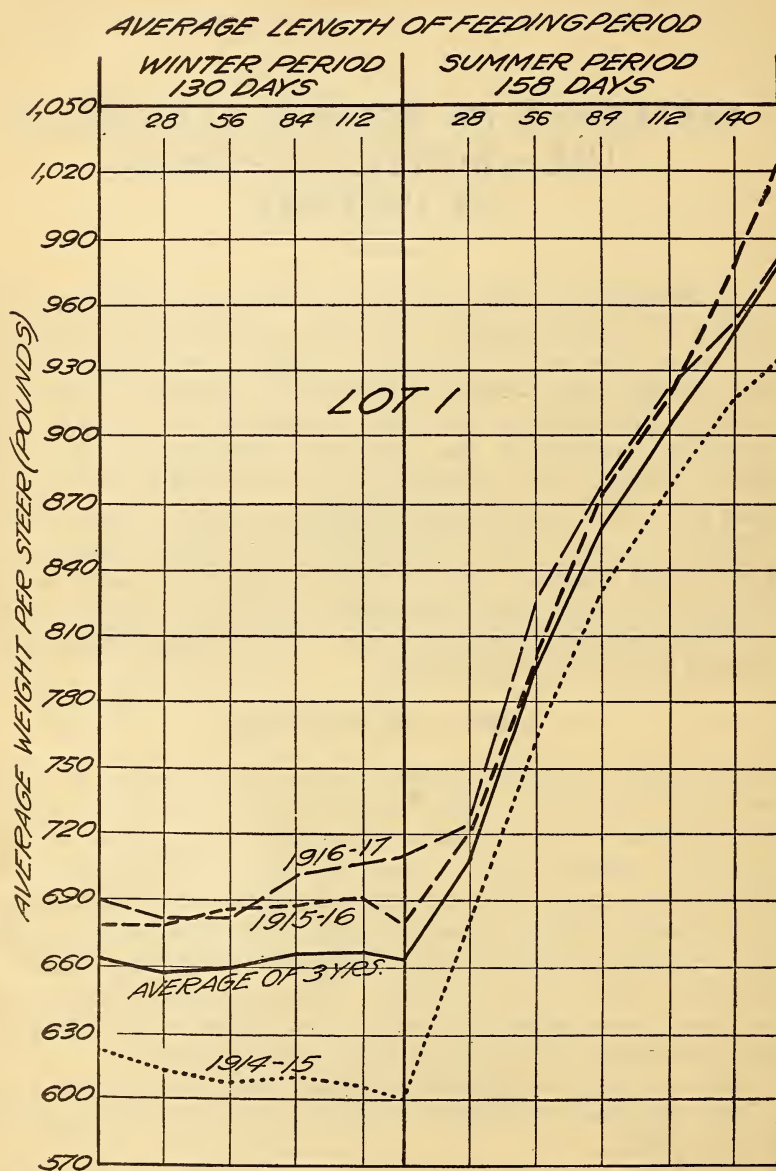


FIG. 1.—Annual and average results of winter and summer (grass) feeding for Lot 1. These steers received a winter ration of corn silage, 19.8 pounds; mixed hay, 5 pounds; and wheat straw, 2.5 pounds.

KINDS OF STEERS USED.

Grade Shorthorn, Hereford, and Aberdeen-Angus steers, raised in southern West Virginia, were used. They were long yearlings (one year old the previous spring), weighing on the average during the four years 664 pounds in the fall, and were uniform each year in age, weight, quality, and condition.

METHOD OF FEEDING AND HANDLING.

Before beginning the winter feeding the steers were divided as equally as possible into lots of 10 head each. Each lot was given an open pen 30 by 60 feet and equal space in open sheds. The steers were fed twice daily, and water and salt were always available.

The grass was usually ready about May 1 to have the steers turned on it. At the end of the summer period they were ready to be fattened for market on harvested feeds or to be wintered as stockers again and fattened on grass the following summer.

FEEDS USED.

The feeds used, samples of which were analyzed, were average or below in respect to their contents of nutrients. The cottonseed meal was 41 per cent protein the first year and 36 per cent protein the last 3 years. The silage was a mixture of dent and silage corn. The mixed hay was clover and timothy, resulting from sowing timothy with wheat in the fall, and clover the following spring, the crop being cut the year after the wheat harvest.

RATIONS FED.

The steers in Lot 1 received a winter ration of 19.8 pounds of corn silage, 5 pounds of mixed hay, and 2.5 pounds of wheat straw. Lot 2 received 23.1 pounds of corn silage, 4.9 pounds of wheat straw, and 1 pound of cottonseed meal. Lot 3 received 11.9 pounds of mixed hay and 4.1 pounds of wheat straw.

PASTURE.

The pasture consisted of 120 acres of rough, open land and 40 acres of woodland between two small mountains. A small stream furnished abundance of water. The soil, of limestone formation, produced a good growth of blue grass and white clover. Under normal rainfall there was abundant grazing, but the dry weather of the latter part of the summer of 1917 caused the steers to make unusually small gains during the month of August.

GRAPHIC REPRESENTATIONS OF THE LOSSES AND GAINS.

The four accompanying charts show the gains and losses of the steers by 28-day periods. The first three show the effects of the three rations under comparison for the years they were used, one

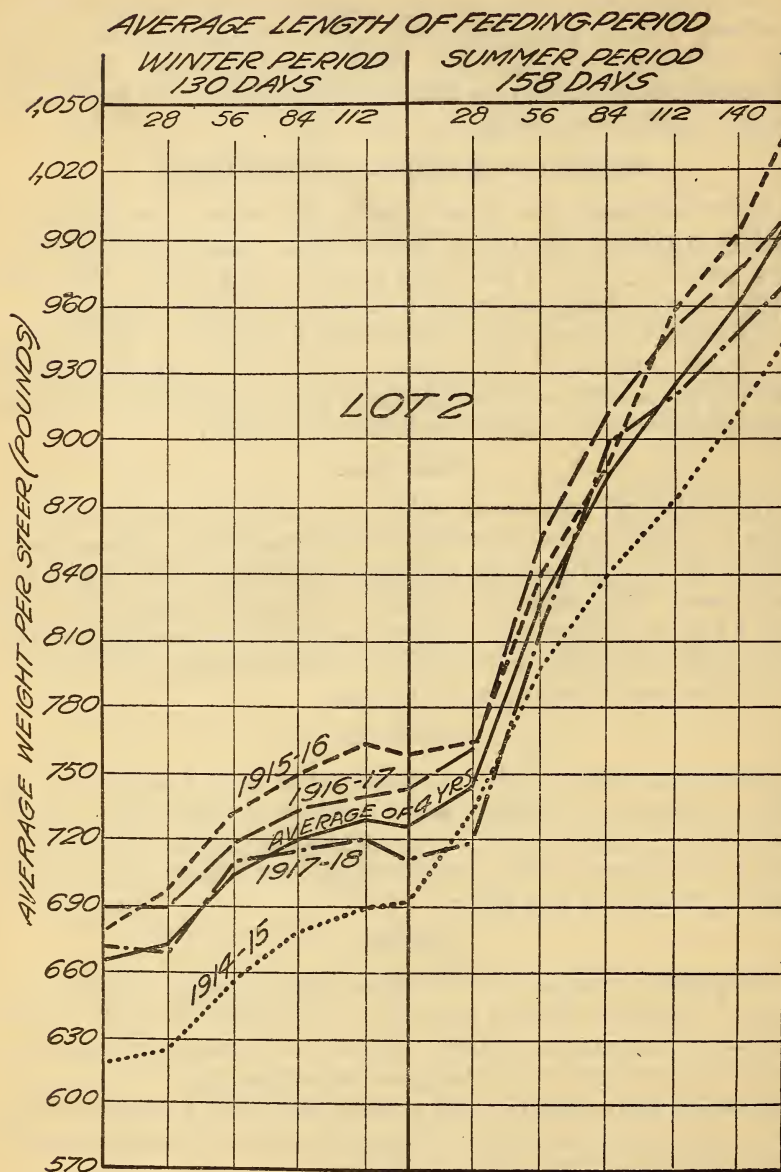


FIG. 2.—Annual and average results of winter and summer (grass) feeding for Lot 2. These steers received a winter ration of corn silage, 23.1 pounds; wheat straw, 4.9 pounds; and cottonseed meal, 1 pound.

chart being used for each ration. The fourth chart is the average for each ration of all the years in which it was used. Each lot was fed the same ration every year.

Horizontal distances on the charts indicate the number of days fed during the winters and pastured during the summers. The average length of the total period for the four years was 288 days, 130 days in the winter or feeding period, and the remaining 158 in the summer or grass period. The heavy, black, vertical line near the center of each chart marks the dividing line between the winter and summer periods.

Vertical distances on the charts represent changes in live weight of the steers. The weights corresponding to each of the horizontal lines are given along the left side of the chart.

Some rather striking facts as to the way steers on different rations vary in weight from period to period during the winter are brought out in figure 4. Note that in Lots 1 and 3 there was a loss in weight each year during the first period of the winter. By the end of the second period the tendency to lose in weight had been overcome, and in most of the trials a slight gain was registered during this period. While the average of Lot 2 showed a small gain during the first period, it is evident that the rapidity of gain was greatly increased during the second period.

With a few exceptions there was a marked loss in weight during the last 18 days of the winter period, as may be noted in figures 1, 2, and 3. This falling off in weight can be attributed to the fact that the coming of the pasture season caused the steers to eat less dry feed and possibly to make less efficient use of what they did eat. Cattle fed on dry feed during the winter become restless with the appearance of grass and lose their desire for the dry and less appetizing feeds which they have been receiving.

There are some very noticeable differences in the gains made by the different lots during the first 28 days of the pasture season. With one exception, all lots in each trial took on weight.

As would be expected, the steers of Lot 3, which had lost considerable weight, and the steers of Lot 1, which barely had maintained their weight during the winter, made greater gains during the first month on pasture than the steers of Lot 2, which had made a steady gain throughout the winter.

The greatest gains from pasture were made by the steers in Lot 1, although the difference between this lot and Lot 3 is so slight as to be almost negligible. While the summer gains of the steers of Lot 2, fed silage, cottonseed meal, and straw were not so large as those of the other two lots, the total of both winter and summer gains shows an increase of 49 pounds over the gain made by the steers fed mixed

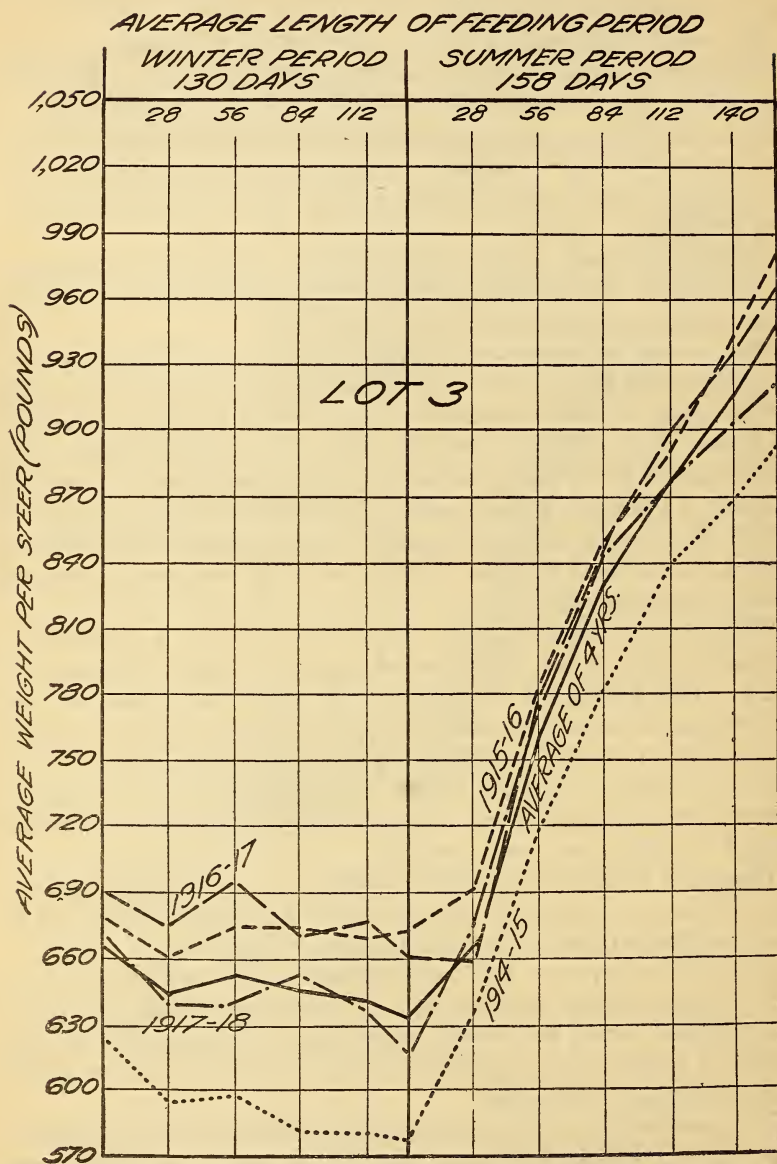


FIG. 3.—Annual and average results of winter and summer (grass) feeding for Lot 3. These steers received a winter ration of mixed hay, 11.9 pounds, and wheat straw, 4.1 pounds.

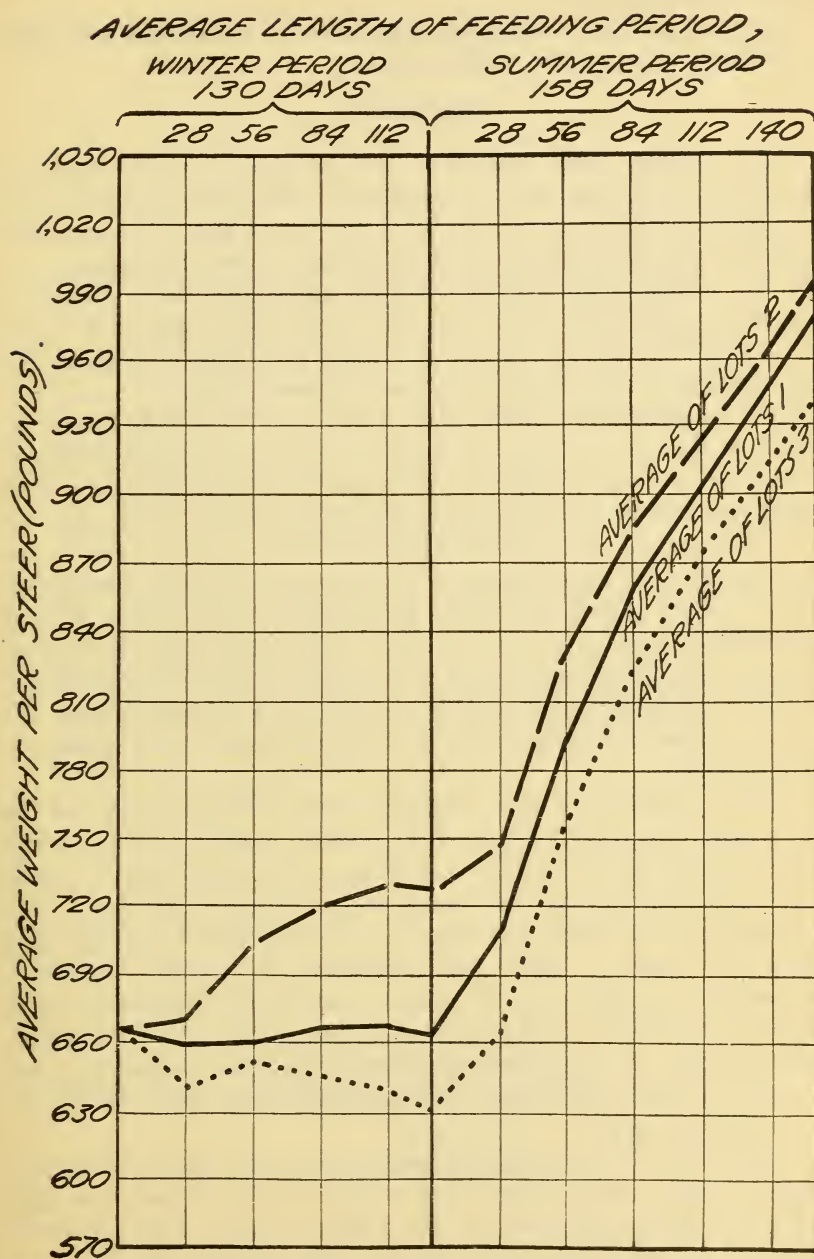


FIG. 4.—Average results of winter and summer feeding for three lots used in the experiment.

hay and wheat straw, and 14 pounds over those fed corn silage, mixed hay, and wheat straw.

There is a marked uniformity in the effect of the rations used upon the steers fed during the various trials.

SUMMARY.

1. An average daily ration of 19.8 pounds of corn silage, 5.0 pounds of mixed hay and 2.5 pounds of wheat straw (Lot 1) fed for 130 days during the winter to average good steers weighing 663 pounds practically maintained them without a loss in weight.

2. An average daily ration of 23.1 pounds of corn silage, 4.9 pounds of wheat straw, and 1 pound of cottonseed meal (Lot 2) fed for 130 days during the winter to average good steers weighing 664 pounds resulted in an average gain of 62 pounds each.

3. An average daily ration of 11.9 pounds of mixed hay, and 4.1 pounds of wheat straw (Lot 3) fed for 130 days during the winter to average good steers weighing 665 pounds did not maintain their weight, but resulted in an average loss of about 35 pounds each.

4. Whereas, the two lots of silage-fed steers (Lots 1 and 2) received practically equal amounts of digestible nutrients during the winter feeding period, the steers fed cottonseed meal (Lot 2) and, consequently, more protein, gained in weight (62 pounds per steer), while the steers receiving mixed hay barely maintained their weight.

5. The silage-fed steers in Lots 1 and 2 were carried through the winter in better condition than the steers of Lot 3, fed wholly on dry roughage.

6. Steers wintered on dry roughage alone (Lot 3), which lost the most weight during the winter (35 pounds), and those fed a maintenance ration only of which corn silage was a part (Lot 1), made greater gains during the first month on grass than those steers (Lot 2) which had also received a silage ration and made 62 pounds gain during the winter. There was, therefore, 97 pounds difference between the average weight of steers in Lots 2 and 3 and 63 pounds between Lots 1 and 2, when turned onto grass at the end of the winter feeding period. It was largely due to this difference in condition that the steers in Lots 1 and 3 were able to make greater gains during the first 28 days on grass.

7. There was a very slight tendency among the steers fed on dry roughage alone during the previous winter (Lot 3) to make less gain during the last two months of the pasture season than the steers which had received silage in the winter ration (Lots 1 and 2).

8. The silage-fed steers made greater gains for the entire year, including both winter and summer, than the steers fed dry roughage alone.

**PUBLICATIONS OF UNITED STATES DEPARTMENT OF AGRICULTURE
RELATING TO BEEF CATTLE.**

AVAILABLE FOR FREE DISTRIBUTION BY THE DEPARTMENT.

Economic Cattle Feeding in the Corn Belt. (Farmers' Bulletin 588.)
Feeding and Management of Dairy Calves and Young Dairy Stock. (Farmers' Bulletin 777.)
The Production of Baby Beef. (Farmers' Bulletin 811.)

**FOR SALE BY THE SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING
OFFICE, WASHINGTON, D. C.**

The Theory of Correlation as Applied to Farm-Survey Data on Fattening Baby Beef. (Department Bulletin 504.) Price, 5 cents.
Wintering and Fattening Beef Cattle in North Carolina. (Department Bulletin 628.) Price, 10 cents.
A Comparison of Concentrates for Fattening Steers in the South. (Department Bulletin 761.) Price, 5 cents.
A Comparison of Roughages for Fattening Steers in the South. (Department Bulletin 762.) Price, 5 cents.

11

ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.
AT
5 CENTS PER COPY

∇

